

### MPM 2D Opener

Calculate the coordinate of B if A (6,3) and the Midpoint of AB is (9,5). State all appropriate formulas.

Sep 29-7:41 AM

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$$\begin{aligned} x_m &= \frac{x_1 + x_2}{2} & y_m &= \frac{y_1 + y_2}{2} \\ 9 &= \frac{6 + x_2}{2} & 5 &= \frac{3 + y_2}{2} \\ 18 &= 6 + x_2 & 10 &= 3 + y_2 \\ 18 - 6 &= x_2 & 10 - 3 &= y_2 \\ 12 &= x_2 & 7 &= y_2 \\ B &= (12, 7) \end{aligned}$$

Sep 29-7:41 AM

### (2.2) Length of a Line Segment

The distance between the endpoints of a line segment  $A(x_1, y_1)$  and  $B(x_2, y_2)$  can be calculated using the distance formula:

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

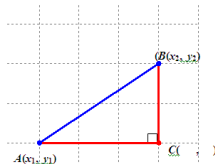
This distance formula is derived from the Pythagorean Theorem.

Determine the coordinates of C. \_\_\_\_\_

Determine an expression for the length of a \_\_\_\_\_

Determine an expression for the length of b \_\_\_\_\_

Use the Pythagorean formula to derive a formula for the length of c.



Mar 4-3:08 PM

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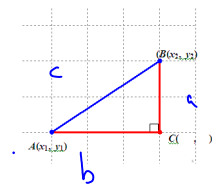
Determine the coordinates of C.  $x_2, y_2$

Determine an expression for the length of a  $c^2 - b^2 = a^2$

Determine an expression for the length of b  $b^2 = c^2 - a^2$

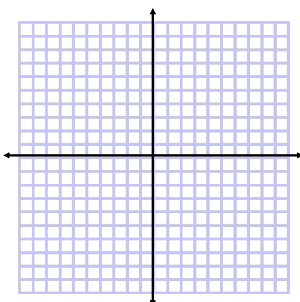
Use the Pythagorean formula to derive a formula for the length of c.

$$a^2 + b^2 = c^2$$



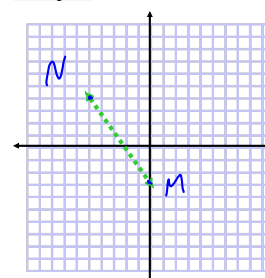
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**Example 1:** Calculate the distance between the points  $M(0, -3)$  and  $N(-5, 4)$



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$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$d = \sqrt{(-5 - 0)^2 + (4 - (-3))^2}$$

$$d = \sqrt{(-5)^2 + (4 + 3)^2}$$

$$d = \sqrt{25 + 49}$$

$$d = \sqrt{74}$$

$$d = 8.6$$

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Homework

Pg. 86 # 1ab, 2ac, 4ef, 5acf, 6, 9

Mar 5-7:57 AM